

Claims:

1. A visualization processing system (VPS1; VPS2) characterized by
  - a first operator (61) for mapping a vector field (70) in a three-dimensional coordinate space (80) to obtain a corresponding sequence of coordinate points,
  - 5 a second operator (62) for determining an elevation degree (A) in a local region of a plane connecting the sequence of coordinate points,
  - a third operator (63) for determining a depression degree (C) in the local region of the plane connecting the sequence of coordinate points,
  - 10 a fourth operator (64) for synthesizing the elevation degree (A) and the depression degree (C) in a weighting manner to determine an elevation-depression degree (B) in the local region of the plane connecting the sequence of coordinate points, and
  - 15 a fifth operator (65) for mapping the coordinate space (80) on a two-dimensional plane (90), providing a tone indication (F) commensurate with the elevation-depression degree to a region on the two-dimensional plane corresponding to the local region of the plane connecting the sequence of coordinate points.
  
2. The visualization processing system (VPS1; VPS2) as claimed in claim 1, characterized in that the elevation degree (B) is defined in terms of a solid angle at one side in the local region of the plane connecting the sequence of coordinate points.
  
- 20 3. The visualization processing system (VPS1; VPS2) as claimed in claim 2, characterized in that the depression degree (C) is defined in terms of a solid angle at the other side in the local region of the plane connecting the sequence of coordinate points.
  
- 25 4. The visualization processing system (VPS1; VPS2) as claimed in claim 1, further characterized by
  - a sixth operator (66) for determining an inclination distribution (D) of the plane connecting the sequence of coordinate points, and
  - 30 the fifth operator (65) providing on the two-dimensional plane a color-toned indication (F) of the inclination distribution (D), and for a brightness thereof, give the tone

indication (F).

5. The visualization processing system (VPS1; VPS2) as claimed in claim 4, characterized in that the fifth operator (65) provides the color-toned indication (F) of the 5 inclination distribution (D) in reddish colors.

6. The visualization processing system (VPS1; VPS2) as claimed in claim 1, further characterized by

10 a seventh operator (67) for connecting, among the sequence of coordinate points, those coordinate points equivalent of an attribute in the vector field (70) to obtain an attribute isopleth line (I), and

an eighth operator (68) for mapping the attribute isopleth line (I) on the two-dimensional plane (90) given the tone indication (F).

15 7. A visualization processing system (VPS1; VPS2) characterized by

a first means (61) for mapping a vector field (70) in a three-dimensional coordinate space (80) to obtain a corresponding sequence of coordinate points,

a second means (62) for determining an elevation degree (A) in a local region of a plane connecting the sequence of coordinate points,

20 a third means (63) for determining a depression degree (C) in the local region of the plane connecting the sequence of coordinate points,

a fourth means (64) for synthesizing the elevation degree (A) and the depression degree (C) in a weighting manner to determine an elevation-depression degree (B) in the local region of the plane connecting the sequence of coordinate points, and

25 a fifth means (65) for mapping the coordinate space (80) on a two-dimensional plane (90), providing a tone indication (F) commensurate with the elevation-depression degree (B) to a region on the two-dimensional plane (90) corresponding to the local region of the plane connecting the sequence of coordinate points.

30 8. A visualization processing method characterized by

a first step (P1) of mapping a vector field (70) in a three-dimensional coordinate space (80) to obtain a corresponding sequence of coordinate points,

a second step (P2) of determining an elevation degree (A) in a local region of a plane connecting the sequence of coordinate points,

5 a third step (P3) of determining a depression degree (C) in the local region of the plane connecting the sequence of coordinate points,

a fourth step (P4) of synthesizing the elevation degree (A) and the depression degree (C) in a weighting manner to determine an elevation-depression degree (B) in the local region of the plane connecting the sequence of coordinate points, and

10 a fifth step (P5) of mapping the coordinate space (80) on a two-dimensional plane (90), providing a tone indication (F) of the elevation-depression degree (B) to a region on the two-dimensional plane (90) corresponding to the local region of the plane connecting the sequence of coordinate points.

15 9. A visualization processing program characterized in that the program is functionable to have a computer execute

a first process (P1) for mapping a vector field (70) in a three-dimensional coordinate space (80) to obtain a corresponding sequence of coordinate points,

20 a second process (P2) for determining an elevation degree (A) in a local region of a plane connecting the sequence of coordinate points,

a third process (P3) for determining a depression degree (C) in the local region of the plane connecting the sequence of coordinate points,

25 a fourth process (P4) for synthesizing the elevation degree (A) and the depression degree (C) in a weighting manner to determine an elevation-depression degree (B) in the local region of the plane connecting the sequence of coordinate points, and

a fifth process (P5) for mapping the coordinate space (80) on a two-dimensional plane (90), providing a tone indication (F) of the elevation-depression degree (B) to a region on the two-dimensional plane (90) corresponding to the local region of the plane connecting the sequence of coordinate points.

10. A visualization processing system (VPS1) for generating a gradient reddening stereoscopic image, characterized by

a database having stored therein a multiplicity of digital data provided with three-dimensional coordinates, and

5 a computer comprising

a means for generating a stereoscopic contour image having contour lines connecting three-dimensional coordinates of digital data having identical Z values,

a means for meshing intervals between contour lines,

10 a means for allocating focused points to meshes, determining an average of differences in Z value between a respective mesh given a focused point and neighboring meshes,

a means for generating a gradient reddening image having assigned to the mesh given the focused point a red tone commensurate with a degree in magnitude of a difference of the average,

15 a means for generating a gray scale image having a varied brightness depending on a ridge-valley shaping tendency of the mesh given the focused point, and

a means for performing a multiplying synthesis of the gradient reddening image and the gray scale image, to display on a screen a gradient reddening stereoscopic image representing degrees of gradient and degrees of height in color.

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11. A visualization processing method for generating a gradient reddening stereoscopic image, characterized by

a step of generating a stereoscopic contour image having contour lines connecting three-dimensional coordinates of digital data having identical Z values,

25 a step of meshing intervals between contour lines, a step of allocating focused points to meshes, determining an average of differences in Z value between a respective mesh given a focused point and neighboring meshes,

a step of generating a gradient reddening image having assigned to the mesh given the focused point a red tone commensurate with a degree in magnitude of a difference of the 30 average,

a step of generating a gray scale image having a varied brightness depending on a ridge-valley shaping tendency of the mesh given the focused point, and

a step of performing a multiplying synthesis of the gradient reddening image and the gray scale image, to display on a screen a gradient reddening stereoscopic image representing

5 degrees of gradient and degrees of height in color.

12. A visualization processing program for generating a gradient reddening stereoscopic image, characterized in that the program is adapted to have a computer function as

a means for reading a multiplicity of digital data provided with three-dimensional  
10 coordinates,

a means for generating a stereoscopic contour image having contour lines connecting three-dimensional coordinates of digital data having identical Z values,

a means for meshing intervals between contour lines,

a means for allocating focused points to meshes, determining an average of differences  
15 in Z value between a respective mesh given a focused point and neighboring meshes,

a means for generating a gradient reddening image having assigned to the mesh given the focused point a red tone commensurate with a degree in magnitude of a difference of the average,

a means for generating a gray scale image having a varied brightness depending on a  
20 ridge-valley shaping tendency of the mesh given the focused point, and

a means for performing a multiplying synthesis of the gradient reddening image and the gray scale image, to display on a screen a gradient reddening stereoscopic image representing degrees of gradient and degrees of height in color.